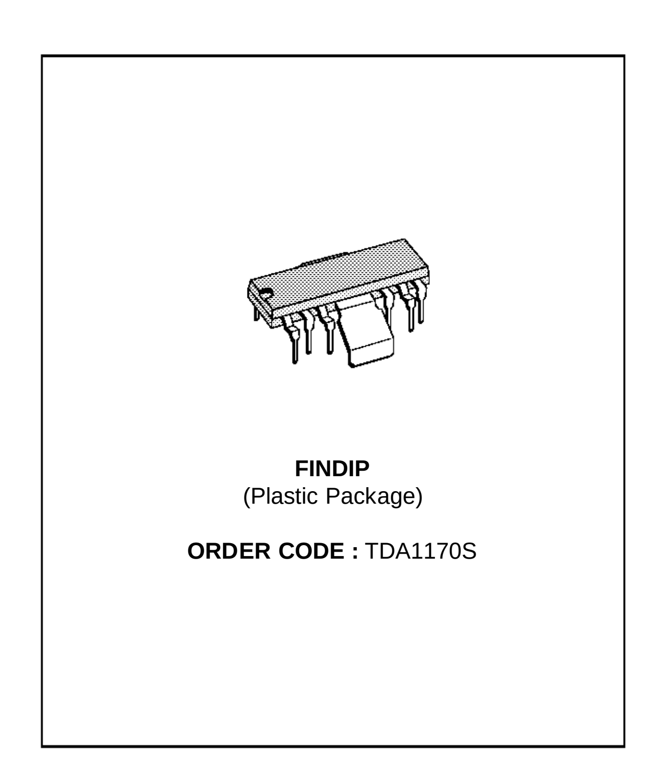


TDA1170S

TV VERTICAL DEFLECTION

- SYNCHRONIZATION CIRCUIT
- OSCILLATOR AND RAMP GENERATOR
- HIGH POWER GAIN AMPLIFIER
- FLYBACK GENERATOR
- VOLTAGE REGULATOR



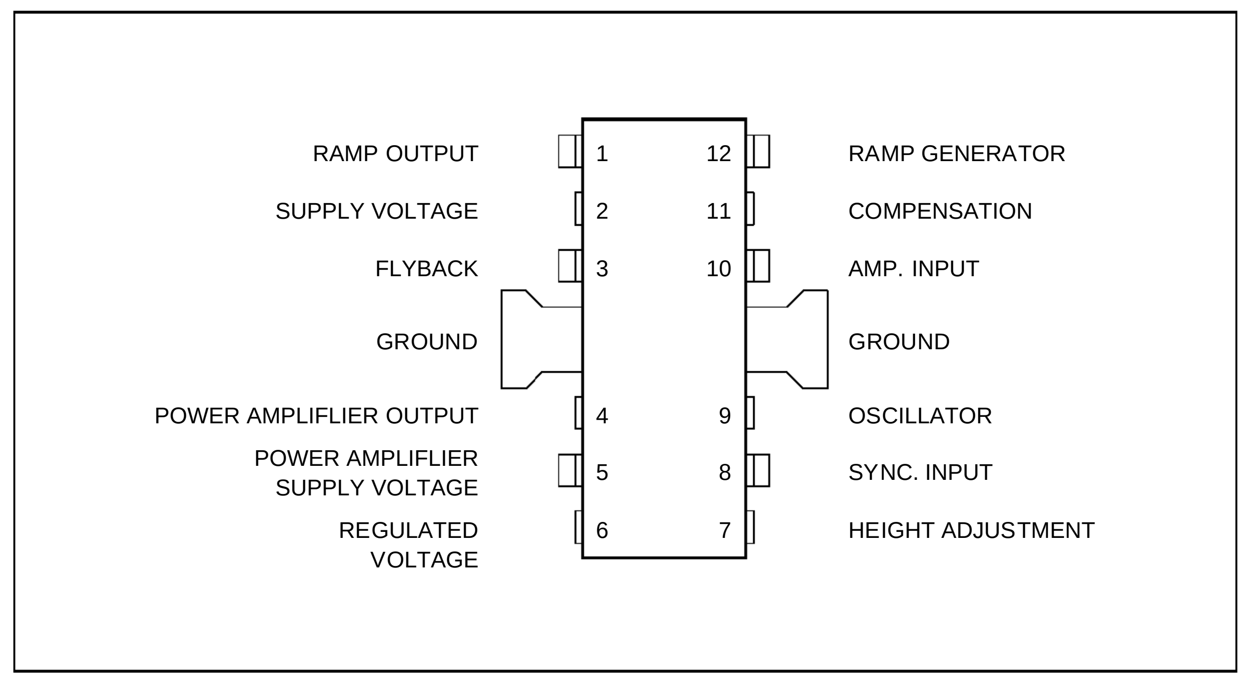
FINDIP
(Plastic Package)

ORDER CODE : TDA1170S

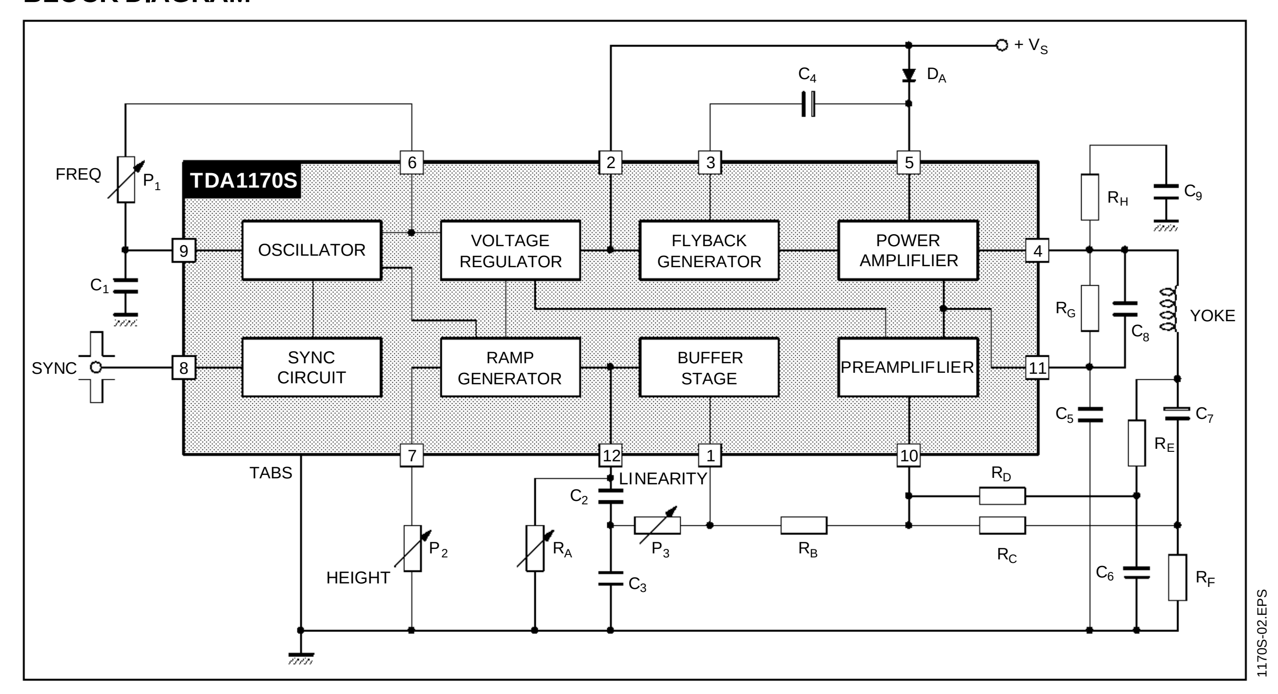
DESCRIPTION

The TDA1170S is a monolithic integrated circuit in a 12-lead quad in-line plastic package. It is intended for use in black and white and colour TV receivers.

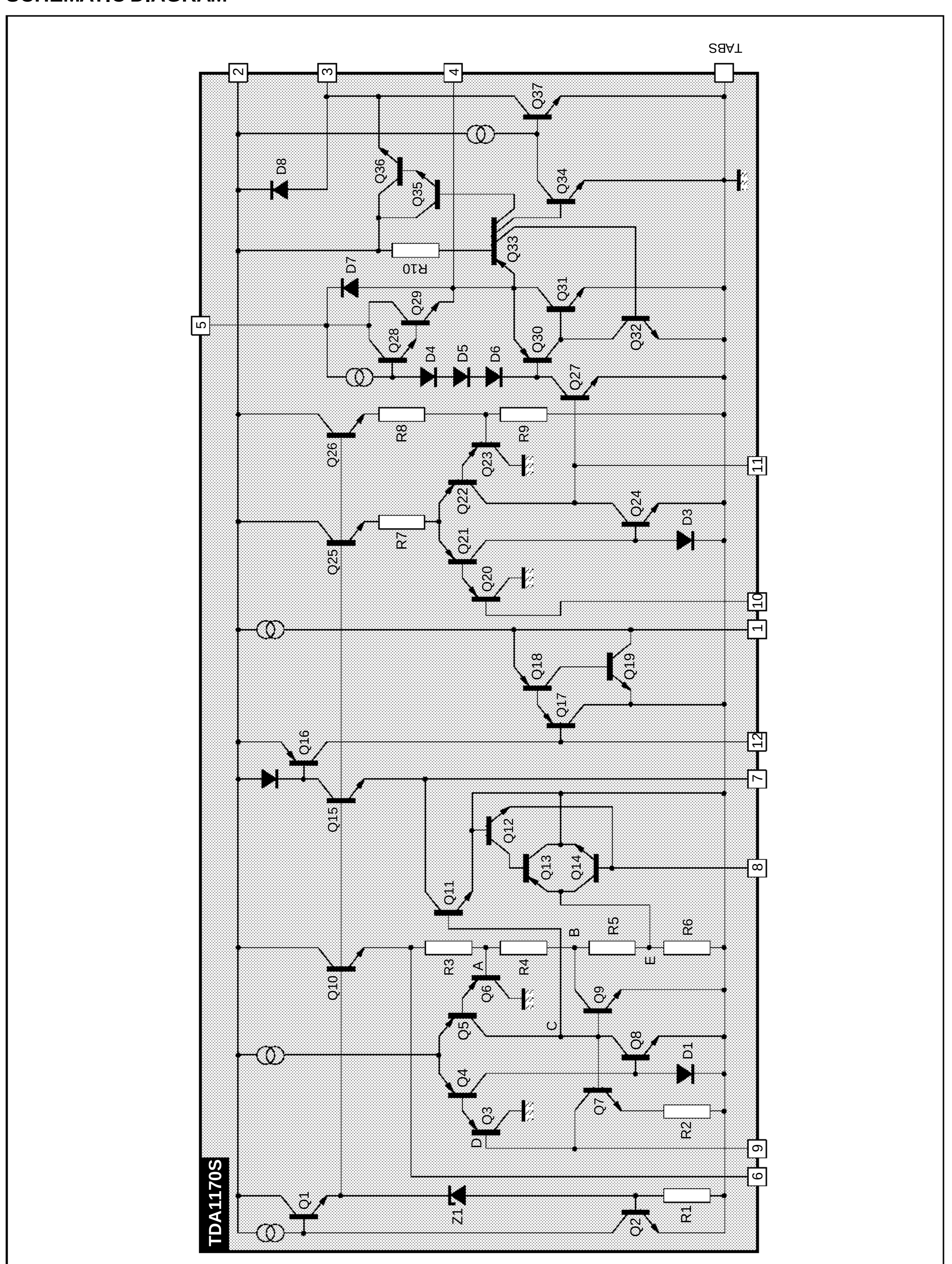
PIN CONNECTIONS



BLOCK DIAGRAM



SCHEMATIC DIAGRAM



1170S-03.EPS

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_S	Supply Voltage at Pin 2	35	V
V_4, V_5	Flyback Peak Voltage	60	V
V_{10}	Power Amplifier Input Voltage	+ 10 – 0.5	V V
I_o	Output Peak Current (non repetitive) at t = 2msec	2	A
I_o	Output Peak Current at f = 50Hz t ≤ 10µsec	2.5	A
I_o	Output Peak Current at f = 50Hz t > 10µsec	1.5	A
I_3	Pin 3 DC Current at V_4 2	100	mA
I_3	Pin 3 Peak to Peak Flyback Current for f = 50Hz, t_{fly} ≤ 1.5msec	1.8	A
I_8	Pin 8 Current	± 20	mA
P_{tot}	Power Dissipation : at T_{tab} = 90 °C at T_{amb} = 80 ° C	5 1	W W
T_{stg}, T_j	Storage and Junction Temperature	– 40, + 150	°C

1170S-01.TBL

THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th\ j-tab}$	Thermal Resistance Junction–tab	Max	12	°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	70	°C/W

1170S-02.TBL

(°) Obtained with tabs soldered to printed circuit with minimized copper area.

ELECTRICAL CHARACTERISTICS

(refer to the test circuits, V_S = 35V, T_{amb} = 25°C, unless otherwise specified)

DC CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.
I_2	Pin 2 Quiescent Current	I_3 = 0		7	14	mA	1b
I_5	Pin 5 Quiescent Current	I_4 = 0		8	15	mA	1b
$– I_9$	Oscillator Bias Current	V_9 = 1V		0.1	1	µA	1a
$– I_{10}$	Amplifier Input Bias Current	V_{10} = 1V		0.1	1	µA	1b
$– I_{12}$	Ramp Generator Bias Current	V_{12} = 0		0.02	0.3	µA	1a
$– I_{12}$	Ramp Generator Current	I_7 = 20 µA, V_{12} = 0	19	20	24	µA	1b
$\frac{\Delta I_{12}}{I_{12}}$	Ramp Generator Non-linearity	ΔV_{12} = 0 to 12V, I_7 = 20µA		0.2	1	%	1b
V_s	Supply Voltage Range		10		35	V	–
V_1	Pin 1 Saturation Voltage to Ground	I_1 = 1 mA		1	1.4	V	–
V_3	Pin 3 Saturation Voltage to Ground	I_3 = 10 mA		1.7	2.6	V	1a
V_4	Quiescent Output Voltage	V_S = 10V R1 = 10kΩ , R2 = 10kΩ	4.1	4.4	4.75	V	1a
		V_S = 35V R1 = 30kΩ, R2 = 10kΩ	8.3	8.8	9.45	V	1a
V_{4L}	Output Saturation Voltage to Ground	$– I_4$ = 0.1A $– I_4$ = 0.8A		0.9 1.9	1.2 2.3	V V	1c 1c
V_{4H}	Output Saturation Voltage to Supply	I_4 = 0.1A I_4 = 0.8A		1.4 2.8	2.1 3.2	V V	1d 1d
V_6	Regulated Voltage at Pin 6		6.1	6.5	6.9	V	1b
V_7	Regulated Voltage at Pin 7	I_7 = 20µA	6.2	6.6	7	V	1b
$\frac{\Delta V_6}{\Delta V_S}, \frac{\Delta V_7}{\Delta V_S}$	Regulated Voltage Drift with Supply Voltage	ΔV_S = 10 to 35V		1		mV/V	1b
V_{10}	Amplifier Input Reference Voltage		2.07	2.2	2.3	V	–
R8	Pin 8 Input Resistance	V_8 ≤ 0.4V	1			MΩ	1a

1170S-03.TBL

Figure 1 : DC Test Circuit

Figure 1a

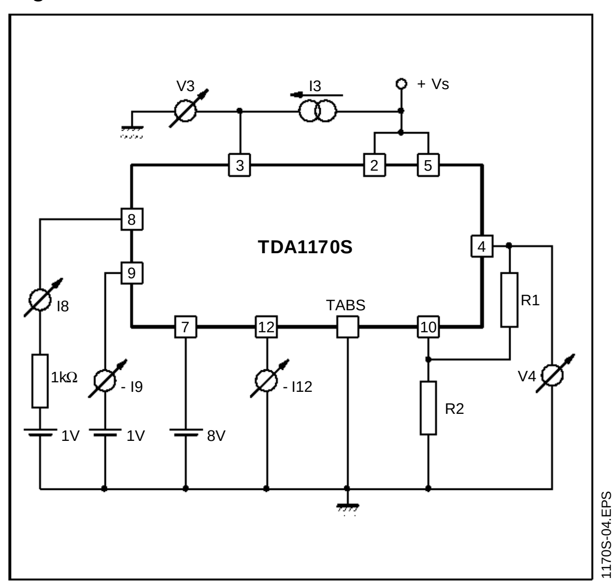


Figure 1b

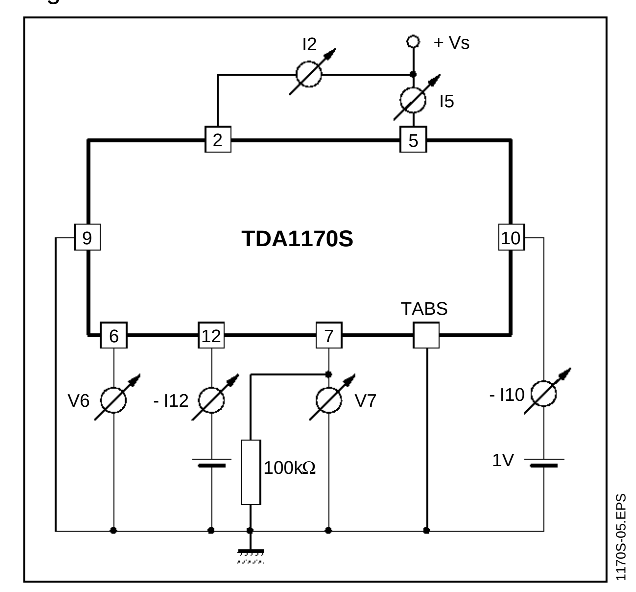


Figure 1c

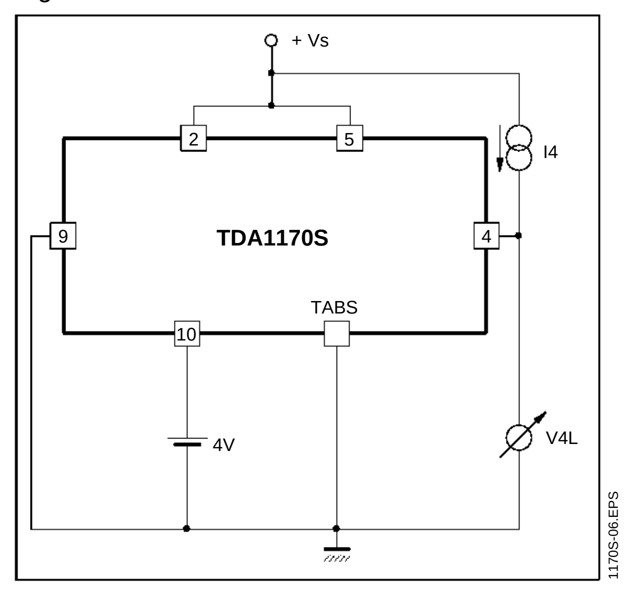
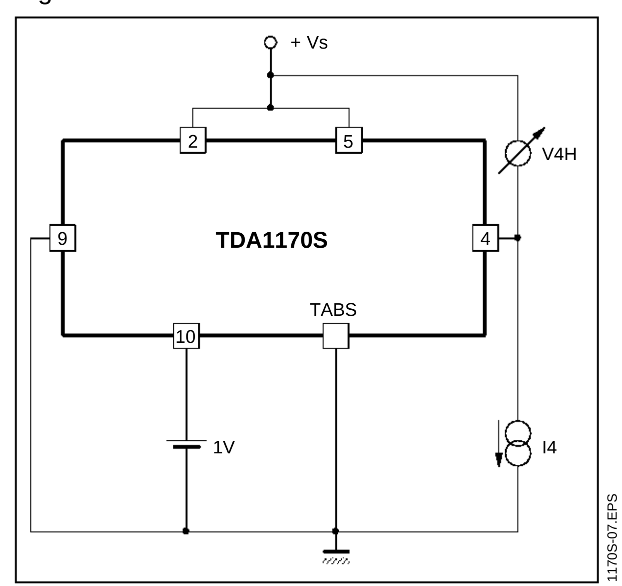


Figure 1d



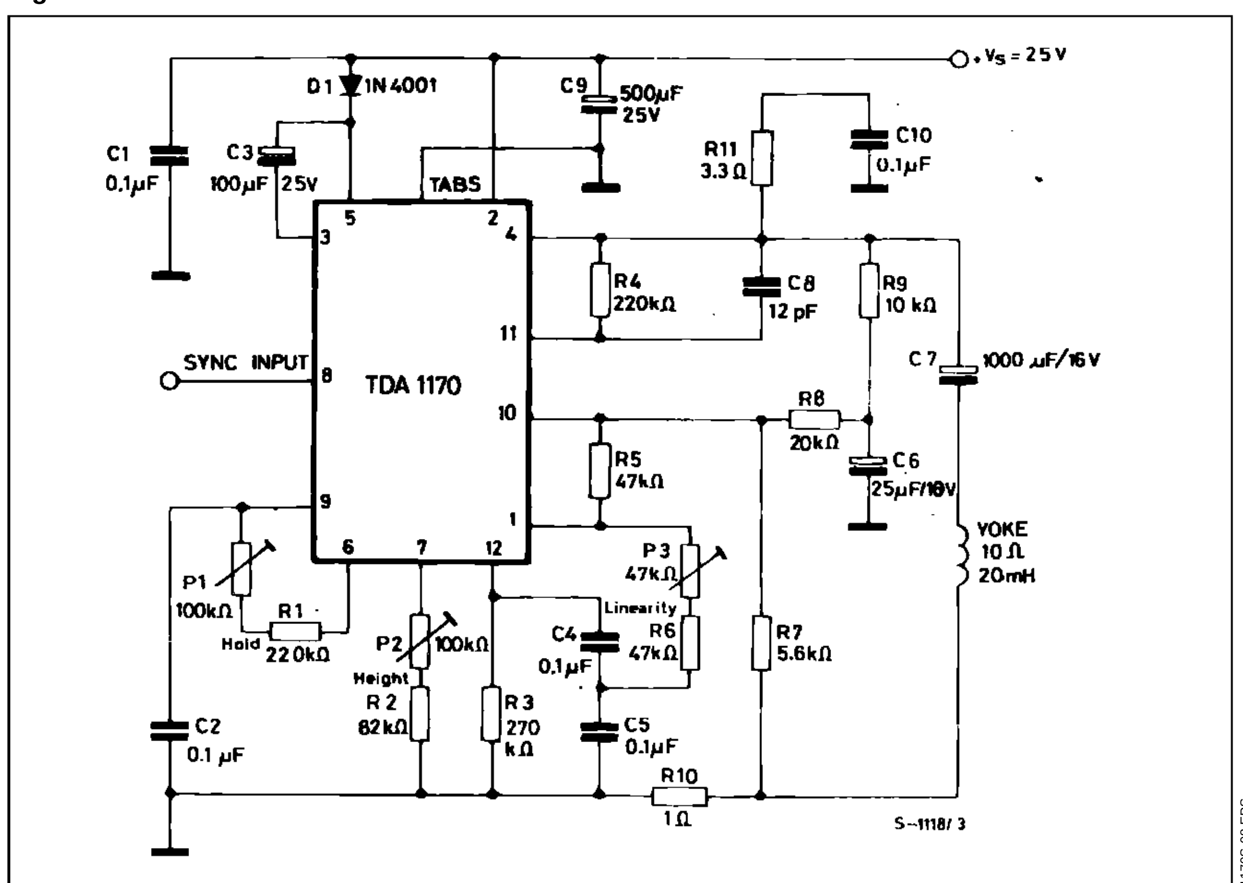
ELECTRICAL CHARACTERISTICS

(refer to the test circuit, V_S = 25V ; f = 50Hz ; T_{amb} = 25^{o}C, unless otherwise specified)
AC CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_s	Supply Current	I_y = 1App		140		mA
I_8	Sync. Input Current (positive or negative)		500			µA
V_4	Flyback Voltage	I_y = 1App		51		V
V_9	Peak to Peak Oscillator Sawtooth Voltage			2.4		V
t_{fly}	Flyback Time	I_y = 1App		0.7		ms
f_o	Free Running Frequency	(P_1 + R_1) = 300kΩ, C2 = 0.1 µF (P_1 + R_1) = 260kΩ, C2 = 0.1 µF		42.2 48.5		Hz Hz
Δf	Synchronization Range	I_8 = 0.5mA	14			Hz
$\frac{\Delta f}{\Delta V_S}$	Frequency Drift with Supply Voltage	V_S = 10 to 35V		0.005		Hz/V
$\left\lvert \frac{\Delta f}{\Delta T_{tab}} \right\rvert$	Frequency Drift with Tab Temperature	T_{tab} = 40 to 120°C		0.01		Hz/°C

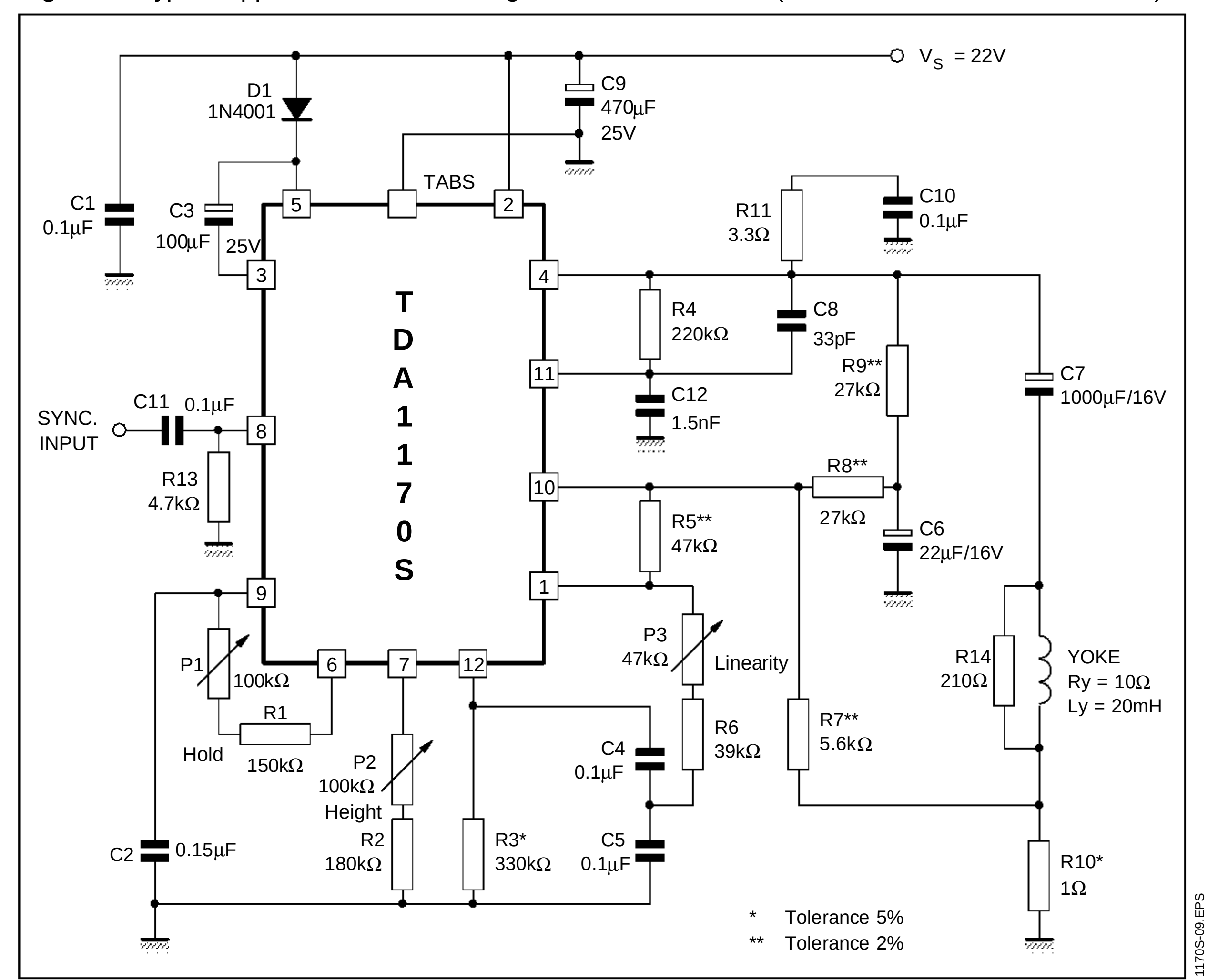
1170S-04.TBL

Figure 2 : AC Test Circuit



1170S-08.EPS

Figure 3 : Typical Application Circuit for Large Screen B/W TV SET (R_Y = 10Ω, L_Y = 20mH, I_Y = 1APP)



TYPICAL PERFORMANCE

Symbol	Parameter	Value	Unit
V_S	Operating Supply Voltage	22	V
I_s	Supply Current	145	mA
t_{fly}	Flyback Time	0.7	ms
P_{tot}	Power Dissipation	2.3	W
I_y	Maximum Scanning Current (peak to peak)	1.2	A

1170S-05.TBL

For safe working up to T_{amb} = 60°C a heatsink of R_{th} = 14°C/W is required.

MOUNTING INSTRUCTION

The junction to ambient thermal resistance of the TDA 1170S can be reduced by soldering the tabs to a suitable copper area of the printed circuit board (fig. 4) or to an external heatsink (fig. 5).

The diagram of fig. 6 shows the maximum dissipable power P_{tot} and the $R_{th\ j\text{-}amb}$ as a function of the side "s" of two equal square copper areas having a thickness of 35 µ (1.4 mil).

Figure 4 : Example of P.C Board Copper Are is Used as Heatsink

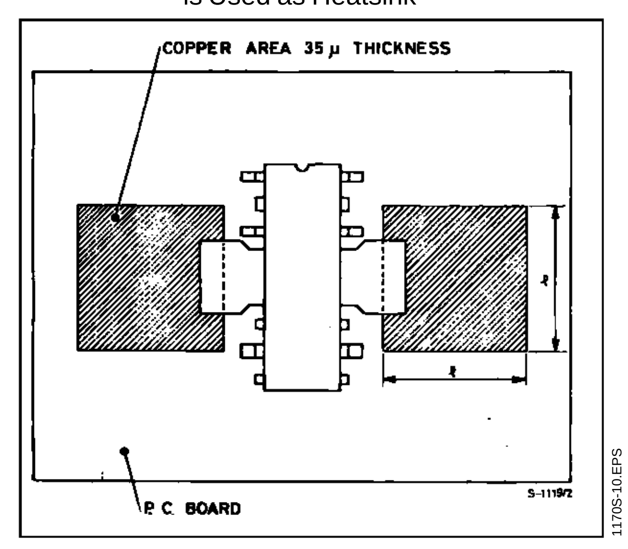


Figure 5 : Example with External Heatsink

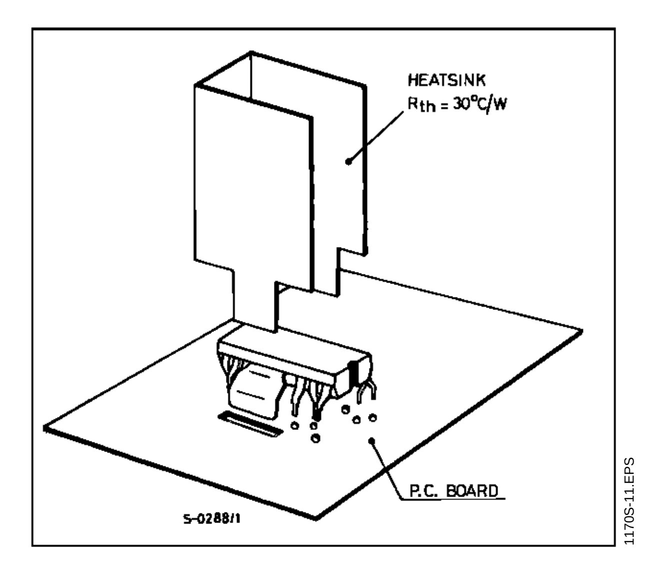


Figure 6 : Maximum Power Dissipation and Junction-Ambient Thermal Resistance versus "S"

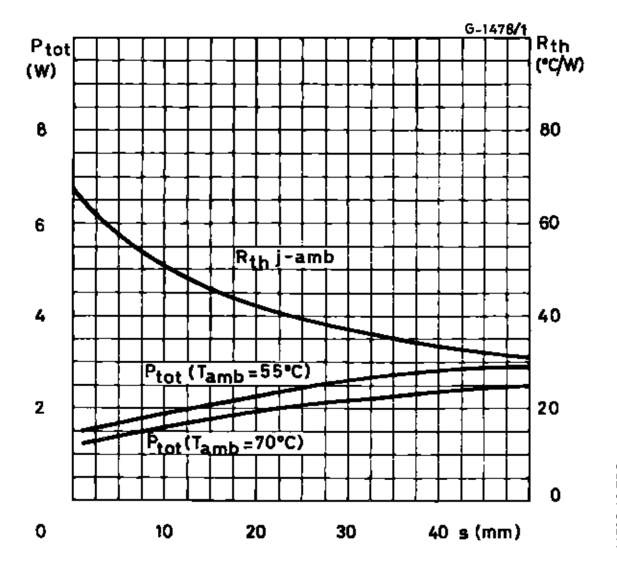
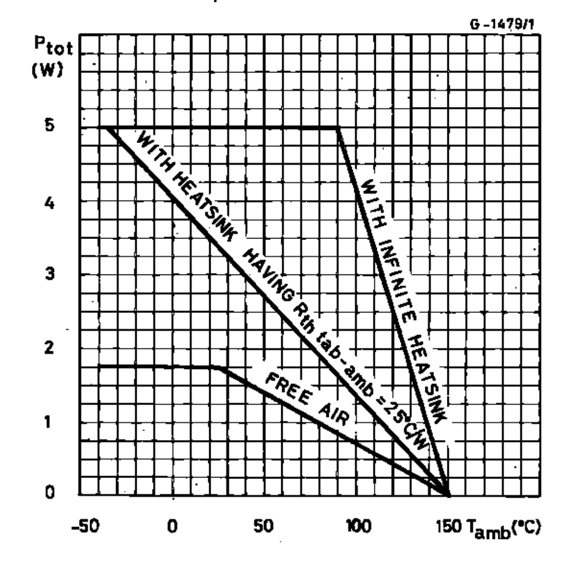
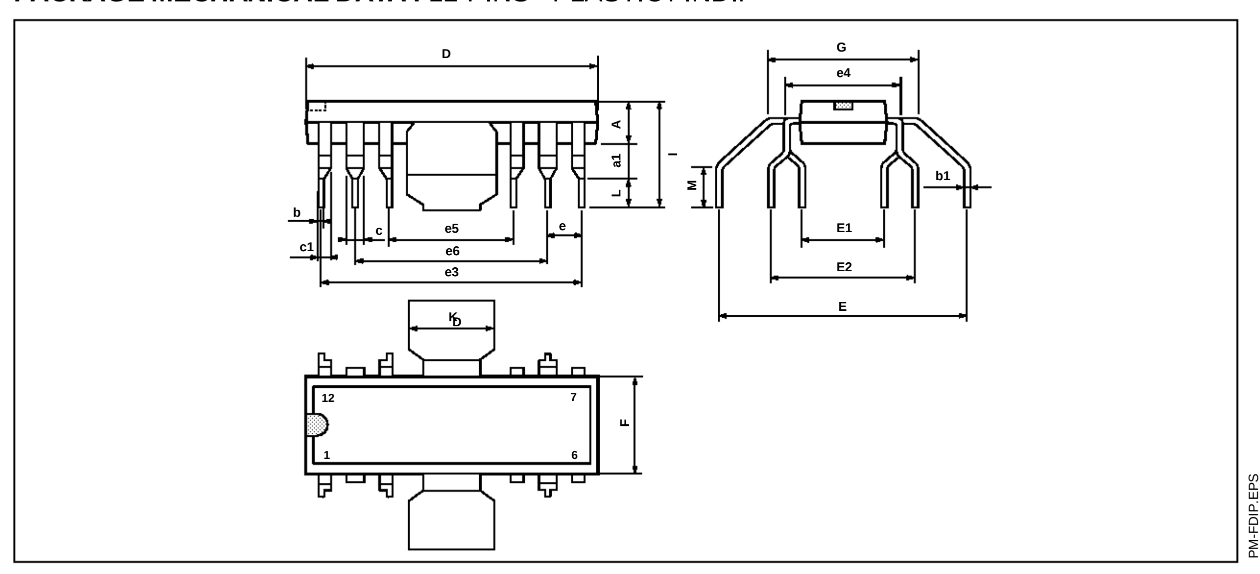


Figure 7 : Maximum Allowable Power Dissipation versus Ambient Temperature



PACKAGE MECHANICAL DATA : 12 PINS - PLASTIC FINDIP



Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	3.8		4.05	0.150		0.159
a1	1.5		1.75	0.059		0.069
b	0.55		0.6	0.022		0.024
b1	0.3		0.35	0.012		0.014
c		1.32			0.052	
c1		0.94			0.037	
D	19.2		19.9	0.756		0.783
E	16.8	17.2	17.6	0.661	0.677	0.693
E1	4.86		5.56	0.191		0.219
E2	10.11		10.81	0.398		0.426
e	2.29	2.54	2.79	0.090	0.100	0.110
e3	17.43	17.78	18.13	0.686	0.700	0.714
e4		7.62			0.300	
e5	7.27	7.62	7.97	0.286	0.300	0.314
e6	12.35	12.7	13.05	0.486	0.500	0.514
F	6.3		7.1	0.248		0.280
G		9.8			0.386	
I	7.8		8.6	0.307		0.339
K	6.1		6.5	0.240		0.256
L	2.5		2.9	0.098		0.114
M	2.5		3.1	0.098		

FINDIP.TBL

